

Dentals are dark: coronals in Irish English

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One of the main claims in favour of the motor theory of speech perception is that the acoustically diverse realisations of a given phonological feature can be unified by reference to some common articulatory topography. A major problem for this account is presented by the phenomenon of ‘feature enhancement’, whereby a distinctive feature value may require or favour the support of a redundant value to achieve phonetic interpretation. In many such relations, a shared topography is impossible to establish. For example, velic opening ([+nasal]) enhances periodicity ([+voice]) in stops; lip rounding ([+round]) enhances dorsal retraction ([+back]). The basis for such connections is not difficult to establish: diverse articulatory manoeuvres collaborate to produce a unitary acoustic effect. This is just one of a range of reasons for concluding that phonological features are defined in auditory-perceptual rather than articulatory terms.

The paper illustrates this general point by an analysis of dentalisation in Irish English. In one northern type of Irish English, coronal non-continuants are alveolar unless followed within the same phonological word by *r* or rhotic schwa, in which case they are dental. *t*, *d*, *n*, *l* are thus dental in, for example, **track**, **draw**, **matter**, **ladder**, **manner**, **pillar**.

Standard feature-based accounts of dentalisation take [+distributed] to be the active property. However, it is hard to identify a local cause for the process when couched in these terms: coronals become dental (i.e. [+distributed]) before *r*, which is apical (i.e. [–distributed]).

On the other hand, it is possible to view the process as assimilatory, by referring to the fact that *r* is ‘dark’ or ‘broad’ in the relevant dialects: acoustically, energy is shifted down in the frequency domain. It is this property that can be assumed to spread from *r* to coronals. The paper presents data showing (i) that *r* is darker in Irish English than in clear-*r* dialects and (ii) that the overall gravity of the spectrum is lower in dental contexts than in alveolar contexts.

Darkness in conventional feature terms would presumably be [+back] and perhaps [+round]. Dentalisation might then be seen as a case of feature enhancement. [+round] enhances [+back]: [+back] pushes F2 down towards F1, and [+round] pushes it even further. If Irish English coronals acquire [+back] (and perhaps [+round]) from a following *r*, this effect might then be considered to be enhanced by [+distributed]. However, neither [+distributed] nor [+back] nor [+round] is distinctive in *r* or coronal non-continuants in English. This can hardly be a case of ‘redundant enhancing distinctive’.

Enhancement theory defines pairwise relations between articulatory manoeuvres, each of which corresponds to a particular phonological category. In a model where features are defined in purely auditory-acoustic terms, the manoeuvres in question collaborate to produce a single phonological category. In the dentalisation case, back tongue-body position, lip rounding and distributed laminality are harnessed to produce the single auditory-acoustic category [dark].